

## ABSTRACT OF THE INVENTION

The present invention provides compositions and methods for altering mitochondrial ATP metabolism, including compositions having fusion proteins comprising IF1 polypeptide-derived sequences, as well as binding and functional assays exploiting IF1 interactions with ATP synthase. Also disclosed are methods for identifying an agent capable of reducing mitochondrial ATP hydrolysis and/or increasing mitochondrial ATP synthesis, including pharmaceutical compositions identified by such methods. The invention also provides methods for treating diabetes, and in particular, type 2 DM, using an agent identified according to the disclosed methods.

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